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Art. VII.—1. *The Epidemics of the Middle Ages.* From the German of J. F. C. Hecker, M. D. Translated by B. G. Babington, M. D. Publications of the Sydenham Society. London. 1844.

2. *Proceedings and Debates of the Third National Quarantine and Sanitary Convention, held in the City of New York, April* 27, 28, 29, 30, 1859. Board of Councilmen. Document No. 9.—1. *Report of the Committee on Quarantine;* Wilson Jewell, J. M. Moriarty, M. D., W. T. Wragg, M. D., &c., &c.—2. *Report upon Disinfectants.* By W. C. Van Bibber, M. D.—3. *Report upon Sewerage, Water Supply, and Offal.* By John H. Griscom, M. D.—4. *Report upon the Importance and Economy of Sanitary Measures to Cities.* By John Bell, M. D.—5. *Draft of a Sanitary Code for Cities.* By Henry G. Clark, M. D.

3. *British and Foreign Medico-Chirurgical Review.* January, 1851.

4. *North American Review.* No. XXVII. April, 1820.

"That Omnipotence," says Dr. Hecker, "which has called the world with all its living creatures into one animated being, especially reveals himself in the desolation of great pestilences. The powers of creation come into violent collision; the sultry dryness of the atmosphere; the subterraneous thunders; the mist of overflowing waters, are harbingers of destruction. Nature is not satisfied with the ordinary alternations of life and death, and the destroying angel waves over man and beast his flaming sword. These revolutions are performed in vast cycles, which the spirit of man, limited, as it is, to a narrow circle of perception, is unable to explore. They are, however, greater terrestrial events than any of those which proceed from the discord, the distress, or the passions of nations. . . . . And they take place upon a much grander scale than through the ordinary vicissitudes of war and peace, or the rise and fall of empires, because the powers of nature themselves produce plagues, and subjugate the human will, which, in the contentions of nations, alone predominates."

A most memorable example of this is afforded by the great pestilence of the fourteenth century, which desolated Asia, Europe, and Africa, and which, having, in the short space of four years, swept away *one quarter* of the population of the Old World, gained for itself the ominous title of the "BLACK DEATH." Scarcely recovered from this great catastrophe, Europe was visited by five separate attacks of a new plague, called the "Sweating Sickness," in 1485, 1506, 1517, 1528, and 1551. The plague that devastated London in the seventeenth century continued to visit Marseilles as late as 1720, and Moscow until 1770, in which years, respectively, each of those cities is said to have lost one half of its population; and it remains domesticated on the eastern shores of the Mediterranean, in Egypt, Syria, and Turkey.

At various periods during the Middle Age, also, from 1374 onward, the nations of Central Europe, already ravaged by the Black-Death, the Small-pox, the Measles, and St. Anthony's Fire, or Erysipelas, were afflicted by a disorder of the nervous system, called the Dancing Mania,—also, St. Vitus's Dance, and Tarantism, according as it was ascribed to the influence of the Saint, or to the bite of the *Tarantula.* As late as the last century the semi-involuntary antics of this disease were resumed by the sect of *Convulsionnaires* at the tomb of the Abbé Paris; and even during the last year they showed a partial revival in the hysteric paroxysms of Irish girls, during the Protestant revival in Ireland. Rome was ravaged by intermittent and bilious remittent fevers, as many sections of our country are now. England has long been the home of typhus, France of typhoid fever, and America has added to this list of endemic diseases the Yellow-fever.

After the discovery of Jenner had quelled the ravages of the small-pox, Europe enjoyed a comparative immunity from epidemics until the appearance of a new pestilence, the Cholera, before unheard of. Long known in India, this disease first began to attract attention in 1817, when it broke out with great violence in Bengal, and commenced that fearful march, which did not cease until it had encircled the globe. Passing the mountains in 1818, it leaped over to Ceylon in 1819, and crossed the sea to China in 1820. The following year it was on the Persian Gulf; in 1822 it reached Syria, but did not fairly enter Europe until 1830, when it advanced as far as Moscow. Pursuing a westward course, it visited successively

St. Petersburg, Warsaw, Berlin, and Hamburg, in 1831. In London and Paris it appeared in 1832; and in the same year it overleaped the Atlantic, spread through the United States and Mexico, and ended at the Pacific. The years 1847 to 1850 (inclusive) were consumed in its second western transit from India to Mexico. Since the last-named period, we have had only sporadic cases in some of our large cities, where, it is to be feared, it has found a permanent home. So slow, so steady, and so even in its progress, the march of cholera has been said rarely to exceed the daily journey of a man, and has been fancifully compared to the wanderings of Ahasuerus.

This hasty and imperfect sketch, which has traced the periodical recurrence of pestilence as one of the ordinary vicissitudes in all human history, naturally leads us to inquire what means have been employed for its prevention.

The history of pestilence is the history of Quarantine. Both alike may be traced in the earliest ages, — the one, limited by the smallness of nations, the sparseness of population, and the lack of commercial intercourse; the other, rudimentary, harsh, and oppressive. The segregation of the sick is as old as Moses. The Jewish legislator was not only familiar with contagion, but he inculcated sanitary precepts, and instituted quarantine regulations.

In the thirteenth and fourteenth chapters of Leviticus the most stringent precautionary measures are enjoined upon the children of Israel, with a view to prevent the spread of leprosy; and in the account of the journey of the Israelites from Egypt, we find an instance of the resort to fumigation for the purpose of guarding against the plague, and of retarding its increase when it prevailed. The pestilence having broken out among them, Aaron took his censer, placed therein his incense of aromatic spices, and stood between the living and the dead; and the plague was stayed. Thus the popular belief in the efficacy of pleasant odors to destroy animal effluvia is as ancient as the first instance of contagious disease. The thunders of Sinai and the pains and penalties of the Mosaic law united to enforce a sanitary code, under the necessary and effectual guise of a religious duty.

Equally well informed was the profane world on the subject of pestilence and contagion. In Greece and Rome the public officers bore much similarity, in office and duties, with our boards of health; citizens were separated from those infected with leprosy, — the ancient plague, — and the cattle of herds tainted with a murrain were carefully secluded from contact with others, or killed to secure the general safety. If the quarantine of Romans was less stringent than that of their flocks, it must be ascribed partly to the general disregard of human life, which rendered the lion more valuable than the gladiator, and common cattle than common men.

To the ignorance of physicians is also to be ascribed the fact that no more effectual measures than the kindling of large fires of vine-stalks, laurel, and wormwood, to purify the air, were employed to check an epidemic. Sanitary science was, as it ever has been, secondary to quarantine; and the doctrine of an invader from abroad more popular than the theory of the endemic and domestic origin of disease.

Although Viscount Bernabo, of Reggio, in Italy, as early as 1374, had enforced certain stringent regulations in regard to the plague, then prevalent, — such as that "every plague-patient be taken out of the city into the fields, there to die or recover," — yet no real system of quarantine laws was devised, until commerce had begun to link together strange countries by a common bond of interest and intercourse. It was at Venice, the first truly maritime city, that quarantine was invented; and the laws then established have formed the basis of all similar systems since that time. Whoever visits Venice now can but be surprised that the city should be so healthy as it is. The slimy walls, the moisture of all the lower stories of the houses, the narrow, dark canals of water by no means clean, and the odors of the lagunes, which are very perceptible in summer, would seem to combine to render it the home of periodical fever and cholera. Yet such it is far from being. And its exemption from disease must be ascribed to two reasons, — to the fact that a salt-water tide ebbs and flows in all its streets, and to the care used in its construction, that all its canals and drains might be swept clean by the sea. In such a city it was, living by commerce alone, and rising in wealth and splendor, as its trade increased, from a few huts of reeds to a proud Republic, that the intimate connection with the pestilential regions of the eastern shores of the Mediterranean suggested to its inhabitants the need of a sanitary cordon to secure its ports from the entrance of pest-laden ships. In 1448, the Senate of Venice instituted a code of quarantine. This code obliged all ships arriving from suspected places to undergo a term of probation before they could be allowed to enter the port and discharge their cargoes. Individuals were similarly treated. Here is the germ and the essence of quarantine. A few years anterior to the passage of these laws, the first regularly organized *lazaretto*, or pest-house, was established. It was erected on a small island near the city. All persons arriving from places where the plague was suspected were there detained. The sick from the city, laboring under the disease, were sent thither with their families, and were detained forty days after their cure.

The Republic of Venice also established the first board of health. It consisted of three nobles, and was called the Council of Health. It was ordered to investigate the best means of preserving health, and of preventing the introduction of disease from abroad. Its efforts not having been entirely successful, its powers were enlarged in 1504, so as to grant it "the power of life and death over those who violated the regulations for health." No appeal was allowed from the sentence of this tribunal. Bills of health were introduced in 1527. After the example of Venice, quarantines and lazarettos began to multiply among other nations, and this cumbrous, expensive, and restrictive system has been perpetuated for four hundred years.

It is true that no pen can adequately describe the numerous secondary consequences of pestilence. The panic, the senseless and almost insane dread, can be quelled by no assurances. Thucydides, Boccaccio, Manzoni, De Foe, and Eugene Sue, each in his turn, have left us descriptions which are among the most graphic of their writings. The gradual gathering of the great catastrophe, and its effects upon commerce, industry, confidence, and honesty; the desolation of the city, and the desertion of its public haunts; the harrowing tales of suffering and stories of individual terror, — are nowhere better unfolded than in the Preface to the Decameron. And we may be pardoned, perhaps, if in this connection we give a single extract from Boccaccio. He is writing of Florence.

> "When the evil had become universal, the hearts of all the inhabitants were closed to feelings of humanity. They fled from the sick and all that belonged to them, hoping by these means to save themselves. Some shut themselves up in their houses, with their wives, their children, and household, living on the most costly food, but carefully avoiding all excess. None were allowed access to them; no intelligence of death or sickness was permitted to reach their ears; and they spent their time in singing and music, and other pastimes.
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> "Others, on the contrary, considered eating and drinking to excess, amusements of all descriptions, the indulgence of every gratification, and an indifference to what was passing around them, as the best medicine, and acted accordingly. They wandered day and night, from one tavern to another, and feasted without moderation or bounds. In this way they endeavored to avoid all contact with the sick, and abandoned their houses and property to chance, like men whose death-knell had already tolled.
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> "Amid this general lamentation and woe, the influence and authority of every law, human and divine, vanished. Most of those who were in office had been carried off by the plague, or lay sick, or had lost so many members of their families that they were unable to attend to their duties, so that thenceforth every one acted as he thought proper.
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> "Others, in their mode of living, chose a middle course. They ate and drank what they pleased, and walked abroad, carrying odoriferous flowers, herbs, or spices, which they smelt to from time to time, in order to invigorate the brain, and to avert the baneful influence of the air, infected by the sick, and by the innumerable corpses of those who had died of the plague.
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> "Others carried their precaution still further, and thought the surest way to escape death was by flight. They therefore left the city; women as well as men abandoning their dwellings and their relations, and retiring into the country. But of these also many were carried off, most of them alone and deserted by all the world, themselves having previously set the example. Thus it was that one citizen fled from another, a neighbor from his neighbors, a relation from his relations; and in the end, so completely had terror extinguished every kindlier feeling, that the brother forsook the brother, the sister the sister, the wife her husband; and at last, even the parent his own offspring, and abandoned them, unvisited and unsoothed, to their fate.

Those, therefore, that stood in need of assistance fell a prey to greedy attendants; who, for an exorbitant recompense, merely handed the sick their food and medicine, remained with them in their last moments, and then not unfrequently became themselves victims to their avarice, and lived not to enjoy their extorted gain. Propriety and decorum were extinguished among the helpless sick. Females of rank seemed to forget their natural bashfulness, and committed the care of their persons, indiscriminately, to men and women of the lowest order. No longer were women, relatives or friends, found in the house of mourning to share the grief of the survivors, — no longer was the corpse accompanied to the grave by neighbors and a numerous train of priests, carrying wax tapers and singing psalms, nor was it borne along by other citizens of equal rank. Many breathed their last without a friend to soothe their dying pillow; and few indeed were they who departed amid the lamentations and tears of their friends and kindred. Instead of sorrow and mourning, appeared indifference, frivolity, and mirth; this being considered, especially by the females, as conducive to health.

"Among the middling classes, and especially among the poor, the misery was still greater. Poverty or negligence induced most of these to remain in their dwellings, or in the immediate neighborhood; and thus they fell by thousands; and many ended their lives in the streets, by day and by night. The stench of putrefying corpses was often the first indication to their neighbors that more deaths had occurred. The survivors, to preserve themselves from infection, generally had the bodies taken out of the houses and laid before the doors; where the early morn found them in heaps, exposed to the affrighted gaze of the passing stranger.

"It was no longer possible to have a bier for every corpse, — three or four were generally laid together. Husband and wife, father and mother, with two or three children, were frequently borne to the grave on the same bier."

In 1665, during the plague in London, as we are told by De Foe, the consternation was equally great, and, in the blind hope of checking the disease, "infected houses were not only quarantined and shut up for one month after all the family were dead or recovered, but a guard was placed in front, day and night, to keep out visitors, and a large red cross with the words, '*Lord have mercy upon us*,' painted on the door." Even this, we are gravely informed, did not prevent the spread of the epidemic; but how must it have increased the general terror! Of late years the government has withheld the number of deaths when the cholera has visited Paris. This course, to be sure, is open to the objection, that the community is not sufficiently warned for precautionary measures. In all times the panic of contagion has been the same, in every wide-spread epidemic. Fear of the yellow-fever led to an exhibition of equal barbarity among our own citizens in 1819.

> "Philadelphia, forgetful of her reputation for kindness and hospitality, with a few cases within her own borders, carried the system of exclusion so far as to prohibit all intercourse with her neighbor, Baltimore, refused a shelter to those who were seeking a refuge from the disease, and denied admittance, or even liberty to pass through, to all who had visited any part of that city.
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> "New York, at a time when her citizens, struck with terror, were fleeing in every direction from before the face of the disease, when her stores were shut by hundreds, and all business suspended in consequence of it, and when her courts of justice were closed, or removed to other places, for fear of it, ordered a long quarantine upon vessels which arrived from Boston, where scarcely a shop was shut in consequence of the fever, and the regular course of business was not interrupted. And because a gentleman from Boston, after spending seventeen days at the quarantine ground of New York, in preference to remaining longer under the guardianship of her health officers, chose to return to the place which was the source of their fears, he was advertised at New York, and a reward offered for his apprehension, as though he had been a felon. American ships from England were brought to opposite the lazaretto of New York, and obliged to submit to visits of officers fresh from the exposure to the disease, lest peradventure they had brought the plague from Liverpool. Even New Orleans partook of the general terror, and ordered a quarantine, lest the yellow-fever should be imported from Boston. At the same time Boston was equally engaged in enforcing the same precautions towards her sister cities." — *North American Review*, No. XXVII. (April, 1820).

So is it ever. Even the year just closed has furnished, here in Boston, its wretched examples. In the epidemic which has recently visited us, and which we have enjoyed peculiar facilities for witnessing in the Small-pox Hospital, out of one hundred persons under our charge, several were forced to leave their boarding-houses; one was torn — literally — from his bed by a selfish landlord; and two were found on the pavement, after being ejected and deserted. One poor young man was sent forty miles by the night freight-train, from another city, because there was no receptacle for his dreaded malady there. Death relieved those timid citizens from the fancied danger of his return home. In one instance, we must add, a mother, of good sense and average education, was absolutely unable, through fear, to approach the bed-side of her son during a long and severe attack of the disease. Such instances are rare. The opposite cases, of devotion and affection overcoming all panic, are many. Yet every professional man must have experienced the thousand senseless obstacles which timidity throws in the way of his success in contagious disease. So too the recent epidemic among cattle has been ruled too much by hasty terror, and too little by calm reason. Hundreds of ailing and many sound beeves have been slaughtered, while as yet the contagious nature of the malady has been by no means proved.

It is not surprising that, with such a constitution of human nature, caution should have expressed itself, in all epidemic seasons, in strenuous regulations of quarantine.

The term Quarantine is said to be derived from the Italian *quaranta*, signifying *forty*. Why forty days were fixed upon as the period of purification from disease, we know not. Some refer it to a medical origin, derivable from the doctrine of critical days, — the fortieth day being regarded as the point of separation between acute and chronic diseases. Others think it has its origin in a regard for the forty days' fast of Lent; and still others attribute it to the Mosaic law, which appointed forty days for cleansing the impurities of leprosy. This particular time seems to have been followed in many quarantine systems, as much from routine as with any definite meaning. It may be justly regarded as too long a confinement, where there has been only exposure to and suspicion of disease. But a protracted term of quarantine was among the least of its evils. Fear made it unnecessarily harsh. Thus, in the last century, the laws of quarantine at Philadelphia provided that a penalty of ten pounds should be exacted for harboring any sick person who had been ordered to the pest-house, to be followed by imprisonment in default of payment. In 1774, a provision was added, that any sick person escaping from the pest-island should be fined fifty pounds, and, if unable to pay, should receive twenty lashes on his bare back, well laid on! — a soothing application to the desquamating skin of a small-pox convalescent! In 1803, former laws were repealed, but a new one, both stringent and oppressive, was enacted, which imprisoned the sick and the well together, on board the infected vessel, or in the hospital, detaining the healthy many days, and requiring heavy penalties for any violation of the law. It is not worth our while to look further; for such have ever been the general features of all laws of quarantine. Self-preservation is the most selfish and cruel of instincts; and it is a mistaken aim of self-preservation which dictates all similar statutes.

Apart from the necessary evils inflicted on healthy individuals, the chance of increasing the disease by concentrating the virus in one — and generally an unhealthy — spot, and the perpetuation of the source of infection by the preservation of the *fomites* which originally conveyed or originated it, the injury done by such regulations to private interests, and to all the requirements of commerce, is immense. What could be more fatal to the prosperity of a maritime city, save its being actually the seat of contagious disease? And just in proportion to the extension of commerce, the evil increases. Commerce must be free, easy, rapid in means of communication, and unrestrained. The heaviest duties and the most arbitrary laws of the revenue system are nothing beside the exactions of a quarantine. Therefore we find both Hancock and Russell, who are among the strongest contagionists in sentiment, saying that "Quarantine establishments are certainly a heavy tax on commerce, and the benefit they promise to the state is very precarious, while the detriment to the merchant is real." A similar conclusion has been reached, even in so exposed a place as Marseilles. Early in this century, and not long after a visitation of that city from the plague, strict quarantine laid its fatal embargo on commerce, and a general purification of the city, streets, churches, vaults, public buildings, and houses, was ordered and carried into effect. It was submitted to without a demur, but when, on the return of the distemper, some time afterward, it was proposed to have recourse a second time to this measure, it was effectually opposed by a deputation of the

Chamber of Commerce and the principal merchants, as being a new custom, unknown to all other towns of Europe, unnecessary, inconvenient, and impossible of execution without extreme prejudice to the commercial world.

To how great an extent restrictions, and the venality incident to irresponsible power, are carried in our times, we can best learn by a brief examination of the quarantines of Port Mahon, in the Mediterranean, under the government of Spain, and of New York.

"The quarantine station at Port Mahon," says Dr. Horner, of the United States Navy, "is the place to which every vessel, arriving at *any port* in the kingdom, must resort for riding out her quarantine. The lazaretto, founded in 1794, is not excelled by any in the Mediterranean; it occupies twenty-five acres of ground. The quarantine ground, or anchorage for vessels, is either in the port itself, or in pest-harbor. What can be more unreasonable than that a ship arriving at Cadiz, in the Atlantic, from the West Indies, or any other place considered unhealthy, should be obliged to proceed to Port Mahon, distant five hundred miles, without any allowance for the time consumed, discharge her cargo, incur additional port-taxes, and ride out a quarantine? Vessels from suspected places, or having disease on board, undergo a detention of twenty days. No allowance is made for the length of the passage. Vessels from the United States, 'where yellow-fever exists *exotically*, or *indigenously*, are considered to be infected.' Finally every vessel which has come from any port on the globe, where the inhabitants at the time of sailing were suffering from any pestilential or contagious disease, is quarantined even after its extinction, until the Supreme Junta (the Council of Health) has declared the place to be in a state of health."

Of the system of purification for infected vessels Dr. Horner speaks in the most disparaging terms.

"The vexations of quarantine are nothing in comparison with it. The vessels of unclean patent are sent to pest-harbor, unladen, scuttles and hatches opened, washed within and without, day after day, and fumigated every four days with a disinfecting mixture. The sails, and sometimes the clothes of the passengers and crew, are immersed in sea-water for twenty-four hours. Those vessels having had disease on board, undergo washing and fumigation for six consecutive days, and their quarantine is extended to forty days. As for the crew and passengers, they are fumigated every ten days, and woe to the unfortunate wretches affected with asthma, or any other complaint of the respiratory apparatus. Letters, newspapers, and documents are even worse treated than goods; they are cut, perforated, their envelopes torn off, fumigated, immersed in vinegar, and exposed to the air. After this, they are carefully and cautiously handed to their owners by tongs of prodigious length, and then they are scarcely in a condition to be read. Heavy penalties are imposed for the smallest violations of any of the regulations. To this may be added, that when, in any of these ports, or in any inland places, a disease really, or supposed to be, contagious, breaks out and assumes an epidemic form, the inhabitants are placed in sequestration, and strictly prevented from going out."

A year or two ago, twenty-two ship-captains, whose vessels were undergoing the exactions complained of, in the port of New York, made the following statement in the New York Commercial Advertiser: —

"Vessels are detained a long time at quarantine upon the most trifling pretexts, their cargoes discharged there at a very heavy and unnecessary expense, not to preserve the health of New York, but for the benefit of whom it may concern. We will state a few of the exactions imposed on vessels, and will commence with the Health Officer, who boards the vessel upon her arrival; his fee is $ 6.50. He is followed by the Port Warden, whose fee is $ 5.00, for looking at the hatches. This must be done before the fumigator can be supposed to expose a handful of chloride of lime in the cabin and forecastle, for which his fee is $ 6.00. After which the stevedore (one of whom monopolizes this business) presents his bill for discharging cargo (for signature), before he commences his work, — and he will not commence until his bill is signed as correct; he charges 44 cents per hhd. for discharging sugar, and for other articles in proportion; the charge for this work in New York is but 12 cents per hhd. If we refuse the stevedore's services, and prefer discharging with our crews, we can wait for lighters until the parties in power think proper to send them, the detention probably amounting to more than the exaction of the stevedores. We are charged 8 cents per hhd. cooperage for each hhd. on board, even if not a hhd. should require coopering. After a cargo is discharged, we are again charged $ 6.00 for the farce of exposing a handful of chloride of lime in the hold. After which, whether we have any dunnage on board or not, it is supposed to be burned, for which we are charged $ 6.00. Many vessels, after having obtained permits from the Health Officer to discharge, have been detained from one to two weeks waiting for the stevedore (who monopolizes this business) to discharge them."

From such pictures of stupidity and corruption it is true that certain reductions must be made for ports of higher civilization, or of superior honesty. Yet after allowing a great deal for abuse and exaggeration, we still find enough that is arbitrary and oppressive in all regulations of quarantine, to condemn them. English medical authorities have so far arrived at the same opinion, that they denounce quarantine as doing more continuous and greater injury to the interests of a commercial nation, than cholera, or pestilence itself.

What other arguments could be adduced for a quarantine system, if it were shown that, with the most stringent enactments and the most perfect practical application of them, it is *ineffectual* in preventing either the importation or the spread of pestilence,—that, in comparison with certain other methods, to be presently adduced, it is *unimportant*,—and that, if these methods, of easy, handy, and prompt application at home, were faithfully and fully carried out, it would be, except to a very limited degree, *unnecessary?* These assertions we now propose to prove.

Quarantine measures, no matter how judicious in themselves, or how prudently and strictly they may be carried out, have been heretofore, and ever will be, altogether ineffectual as a certain and absolute means for excluding either epidemics or the endemic maladies of particular localities. In the very face of, apparently, the most impassable barrier, of the most vigilant and extended sanitary cordons,—of all the securities that wisdom could devise, or untiring zeal carry into execution,—epidemic diseases, it is well known, have invaded community after community, while, on the other hand, they have entirely spared regions on their immediate route, where not the slightest precautionary measures had been adopted. This fact is proved by the entire history of endemic cholera, from its first outbreak down to the present time. This disease, as also yellow, typhus, and typhoid fever, will as certainly occur in those places in which their causes have become developed to a sufficient extent, under the strictest system of quarantine, as they will in the absence of all quarantine.

During three centuries, from the period of their introduction, the most rigid and severe quarantine regulations were in force in Italy; and yet, according to Hecker, the plague raged throughout the Italian ports with unprecedented severity. In the great epidemic of 1348, according to Boccaccio, the city of Florence was placed under quarantine; but no human prudence or precaution could prevent the contagion from spreading. At Marseilles, in 1720, there existed a rigorous quarantine, — all vessels from the Levant were strictly isolated for forty days, — but the plague made its appearance in the city, and destroyed fifty thousand of its inhabitants. It was ascribed to importation by a vessel from Sidon. Nevertheless, various writers on the disease have endeavored to prove that it existed in the place before the arrival of the suspected vessel. Another instance of failure occurred at Venice, when Milan was scourged by the plague. But one of the most remarkable instances of the inefficiency of quarantine laws is that of the occurrence of the yellow-fever at Tortosa, in Spain, in 1821. The most rigid restrictions had been enforced, for a considerable time, even before any apprehension of contagion was proclaimed; and yet no place was ever more afflicted than that unfortunate city.

In our own country similar results can be shown. In no place has the failure of quarantine in excluding yellow-fever been more notoriously exhibited than in Philadelphia. From 1700 to 1794, almost no quarantine may be said to have existed at Philadelphia; and although a large commercial intercourse was maintained, during this long period, with the West Indies, where yellow-fever prevailed annually, only four visitations of the disease occurred. But from 1794 to 1820, while a most rigid quarantine was vigorously carried out, the fever prevailed no less than eight times, with varying severity. At New Orleans it has been found, according to La Roche, that the appearance and prevalence of the fever are not influenced by the enforcement of quarantine laws. It has prevailed when those laws were enforced; it has prevailed, also, even during the embargo of war; and it has failed to prevail when no restriction was placed on intercourse with suspected places. From 1819 to 1823, strict quarantine was enforced at Natchez, yet yellow-fever continued to make its appearance year after year, and at the last-named period the quarantine was abandoned as a useless encumbrance. From 1841 to 1849 it was renewed, but the disease continued. In 1855 a more rigid quarantine was enforced, with armed guards on the roads, and a secret police to detect any infraction of the law; yet the fever made its appearance. Vicksburg and Mobile furnish similar histories.

In the case of Philadelphia some allowance must be made for the increasing commerce of the city, and for the various degrees of the epidemic as it prevailed in the West Indies. It is true, also, that the disease may be generally admitted to originate spontaneously in the Southern cities.

New York, it must be admitted, furnishes *prima facie* evidence opposed to that we have cited. During thirty-four years prior to 1809, with no quarantine, the city had seventeen visitations of yellow-fever; but in the thirty-four years subsequent to 1809, with a strict quarantine, only two visitations.

We by no means assert that quarantines do no good; but only that they are not effectual in *excluding* disease, while we hope to show that other means, employed within the cities to be protected, render them needless. A perfect quarantine is, perhaps, an impossibility. If it were practicable, it could not exclude cholera. In these days of rapid locomotion it is impossible to isolate any great business centre. A hundred inland streams of immigration of non-residents may be emptying themselves into the city, while the quarantine is blockading only the harbor. Passengers and baggage, could, and would, be landed a few miles off, at other ports, and enter the town by railroad.

With the facilities offered by steam-communication, the unsettled and varying policy of the different States conspires to render the difficulties in the way of real quarantine insurmountable. Thus New Orleans relaxes her restrictions, while Charleston binds hers closer. Passengers have only to enter one port and take an inland route for the other, and they arrive in spite of the law, and in time to do all the mischief, by importing the contagion, — if there be a contagious element in the disease, — if not in their persons, yet more certainly in their baggage. Many modes of communication with the shore, too, cannot be prevented. The pilot, who boards the pestilential ship, has his home in the city, and returns to it as soon as he has brought the vessel to, at quarantine. The health-officer and the consignees offer the same risks. The crew on board, and the traders on shore, with their covert modes of communication and their traffic in illicit articles, afford another danger: the stevedores and their men, and the crews of the lighters, who receive the cargo, all live on shore, go home without restriction, and may render the whole machinery of quarantine useless, by carrying infection in their clothes.

A still greater inducement tempts the evasion of quarantine. The all-powerful motive of self-interest urges the merchant, as much as a high protective tariff does the smuggler. It is not alone the loss of interest and time, and the danger of damaging a perishable cargo, which constitute the injury inflicted by quarantine. Vessels delayed from arriving from certain ports that monopolize the production of useful or necessary articles of any description, soon cause a demand and a rising market. Often the owner may have a cargo below, which would bring a fortune if it could be offered for sale, but which will slowly diminish, and perhaps perish, in quarantine. To these considerations we must add the prejudice against certain kinds of quarantine goods, and the difficulty of disposing of them. Thus every interest of business is a new argument against quarantines, unless they be effectual and indispensable.

To be sure, if we admit the non-contagious nature of such a disease as yellow-fever, we may safely allow the passengers to go on shore soon after the arrival of the infected vessel. Then the danger remains in the ship, and above all in her hold, before the cargo is discharged. Stevedores engaged in discharging vessels that come into port without sickness, are taken down with fever; showing that the poison is packed away with the cargo, and is liable to make its appearance whenever the goods are moved. If the cargo is landed at the quaratine station, and placed in isolated stores, it is still very difficult to purge it of the infectious principle. Probably chlorine is the only disinfectant which would be effectual; and if the organic virus be similar in composition to other organisms, and contain any hydrogen or moisture, chlorine would certainly induce a chemical change in its character. But this again would be open to the objection of injuring the color of any delicate textile fabrics. A very free exposure to the air would have some effect in diluting the miasm; and although there is no known term of life for the contagious germ, it seems probable that time would have an influence proportioned to its duration. Some poisons, as yellow-fever, are cut short by frost; and this would suggest the efficacy of a very low temperature, if it could be produced, in neutralizing the obnoxious principle, although we think that instances of the disease have occurred in vessels loaded with ice. The system of quarantine, too, should be extended during the entire year to be effectual, since small-pox and typhus are as liable — if not more so — to be communicated in winter as in summer.

Probably the most essential reform, to increase the efficiency of the quarantine system, would be the enforcement of a code of naval hygiene, which should control the sanitary requirements of all ships. In vessels arriving with perishable cargoes from between the tropics, and in emigrant transports, such regulations would be particularly valuable. Thus the germs of disease could be stifled in embryo, and the outbreak of pestilence anticipated. It is not always necessary that a vessel should sail from an infected locality, to have disease induced on board of her, or to cause her to bring it to the place at which she arrives. Hence the fallacy of "bills of health." No pestilence of any kind may prevail at the port of departure, and yet the zymotic elements of infectious disease may be shipped and packed away in the hold, may be brought into action and life by a long inter-tropical voyage, and may either engender the disease on board, or furnish the *fomites* which will originate and spread it, on arriving in port, and discharging cargo. We are aware that the theory of the portability of the zymotic principle is as yet unsettled; but to us it seems a plausible and reasonable way to account for many freaks ascribed to "contagion."

We now inquire, Against what enemies has the toil of four hundred years been striving to erect the impracticable barrier of quarantine? *Against four diseases*, or five, if we include the plague, which seems to have become obsolete in all decently clean countries, except those of the remote East. Nor are all these four diseases strictly foreign as regards ourselves. They are Small-pox, Typhus, Cholera, and Yellow-fever. Three of them are engendered among ourselves, and are preventable, to a greater or less extent. All but yellow-fever can be classed in that fearful list of domestic diseases which belong to every great city, and which form the sanitary barometer of its hygienic state. Those diseases are Cholera; Cholera Infantum; Cholera Morbus; Dysentery; Diarrhœa; Hydrocephalus; Infantile Convulsions; Erysipelas; Scarlatina; Measles; Small-pox; and Typhus, — including also Typhoid-Fever.

Nor is the fatality of these four plagues any fair offset to the mortality resulting from the others. In twenty-five years, epidemic cholera, coming from abroad, and raging five separate times in New York, has caused 12,300 deaths; in the same period, cholera infantum, generated at home, has slain 15,000 infants, and hydrocephalus and convulsions together, 32,400!

Small-pox is a disease almost wholly preventable, yet within fifty years New York has lost 10,000 of its inhabitants by it. Of later years the deaths have been from 400 to 600 annually; and as the mortality does not exceed from five to ten per cent of all the cases, it must have visited and left its mark on perhaps 50,000 other persons. On the other hand, yellow-fever has caused in fifty years, in New York, in Brooklyn, and at the quarantine station combined, only 600 deaths, equivalent to the annual loss by small-pox. Well may the President of the Quarantine and Sanitary Convention say: —

> "Almost from the time of the first settlements of the colonists in this western world, defences against the approaches of disease and death from other places have been the thought and care of every city, town, and hamlet, while they have little dreamed, that with their increase of population, and their compaction, they have in every instance multiplied the sources of disease and death within their own precincts; nay, within their very households. This sad truth has come to be realized in its full weight only in very recent days, and even yet in comparatively few instances, — that in almost any city that can be named upon this hemisphere, the relative danger of the sickness and death of any given number of the inhabitants, from external sources on the one hand, and internal civic and domiciliary causes on the other, is about as *one to one hundred!*"

It may be asked, admitting all this, If a reformed quarantine will do any good at all, why should we not continue it, rather than remove the last seeming barrier to disease ?

The essence of quarantine laws is that they are directed against the importation of pestilences, or contagious diseases. It is plain enough that they cannot check epidemics ; but their efficacy in regard to those diseases which are directly transmitted from person to person remains to be examined. And this introduces us to the vexed question of Contagion.

We will put aside the proposed and partially accepted distinctions between infection and contagion, as tending only to confusion, and confine ourselves to the latter alone. *Contagion* means literally communicable only by *contact*, — by the actual touching of the diseased person, or part. Thus, there are some diseases which will reproduce themselves in a healthy person only by absolute and *immediate* contact: such are scabies and syphilis. It is sufficiently easy to prevent the spread of these. And were the distinction plain between contagious and non-contagious diseases in this sense only, the laws of quarantine would be easy to frame. But another class of diseases reproduce themselves by what is called *mediate* contact. The medium may be the air, when emanations from the bodies of the sick, having become diffused, are so applied to the bodies of those in health ; or it may be the clothes, bedding, or baggage of the sick, all of which come under the technical name of *fomites*. Quarantine can do much toward excluding this class of diseases. Such are small-pox, probably typhus, and perhaps scarlet-fever and measles, though these last are doubtful.

But there is another form of disease, of which it is difficult to prove that the propagation depends either on immediate or mediate contact between the healthy and the sick. Some believe that this class of diseases arise principally from local circumstances. These circumstances they trace to results of decomposition, rather than of secretion. The atmosphere is believed by both parties to be the vehicle of the deleterious substance. But the contagionists attribute the origin of the noxious matter to secretions formed in the bodies of the sick, and thrown off in such quantities as to impregnate the atmosphere sufficiently to apply, through it, to the bodies of the healthy enough of the secreted matter to generate in them the same disease. On the other hand, the non-contagionists attribute the morbid influence to the results of decomposition, by which the organic matters, both animal and vegetable, that are met with in certain situations, when acted on by the great promoters of decomposition, heat and moisture, become converted into poisonous gases, which mix with the air respired, and thus produce disease. Under this last head we are disposed to place yellow-fever; and to this cause we ascribe the *origin* of typhus (in *animal* effluvia), in distinction from its mode of communication. Here too we would class typhoid, both as to its cause and its communicability.

Beside all this, others believe in an unknown and not-to-be-detected agent of disease in the air, which, for want of a more positive knowledge and name, they call its *epidemic condition.* Whether caused by spontaneous change, by varieties of electric tension, by the presence of organic spores, by too much or too little ozone, or by a more subtle process of decomposition than those which are palpable to the senses, — in which respect it might be compared to the miasm of intermittents, — although it cannot be detected by our present means of investigation, it is yet plainly traceable in its effects on the population who breathe it. It furnishes, too, an explanation of many of the differences in the healthiness of the same localities at different times; and accounts for the progress of certain migratory diseases over large areas of country, including every variety of climate, soil, and season. By this supposition we are disposed to explain the rise and course of epidemic cholera.

It is the difference of opinion as to the manner in which diseases propagate themselves, between contagionists and non-contagionists, that causes all the discussion between the quarantinists and the non-quarantinists. Both parties believe that the atmosphere is the vehicle; but they differ as to the nature and origin of the poison which the atmosphere conveys. Unfortunately, our greatest pestilences are the very diseases about which the most uncertainty prevails: they are cholera and yellow-fever. Small-pox may be definitely assigned to the contagionists; while typhus — besides that it is rarely prevalent, not having appeared as an epidemic since the Irish Famine — is thought by many to be non-contagious. But we will examine this subject again. Under whichever head we may place the modern plagues, we find an almost equal difficulty in accomplishing their prophylaxis. If contagious — purely contagious — they must be excluded by quarantine; but if non-contagious, or zymotic, dependent on conditions of the air or decomposing effluvia, they are to be regulated by sanitary measures. Both means are rendered difficult of application, — quarantine by the violated interests of commerce, and hygiene by the popular ignorance and carelessness.

A disease which is the effect of contagion *always* has the property of communicating itself to other persons, provided the same circumstances exist as those by which it was itself produced. Now in the case of yellow-fever, if we admit, for the sake of argument, that it may be caused by a communication from one individual to another, as well as by local exhalations, in order to prove that either of these is the true cause of the disease, it is necessary to show that the disease is produced by it under circumstances which preclude all possibility of the operation of the other. If by contagion, it must be in a locality where the disease has not prevailed as an epidemic; and if by local causes, it must affect individuals alike, who can have had no communication with one another. The former we judge very difficult, and the latter very easy, to prove satisfactorily. If we examine the cases adduced as evidence that this is a contagious fever, we shall find, generally at least, that the subjects of it had been exposed to the same local causes of disease as those from whom they were supposed to receive it. They had visited, nursed, and watched with their sick friends, or, if they had not entered their rooms, had gone through the infected district. Such is the usual history of those who contract our endemic typhoid fever, and they often ascribe it to similar exposure. The opinion is not uncommon, outside of the profession, that typhoid is contagious; but such is not the view of physicians. Take, for instance, a country village, with one or two houses exposed to a foul sewer, a badly drained barn-yard, or the too free use of night-soil or kelp as dressing, either of which causes may be palpable to the sense of smell. Typhoid seizes on several members of these households in succession. The hired nurse and the sympathizing neighbors who watch with the sick all draw in the same local miasm, and all receive the poison, in degrees of intensity varying with the duration of their exposure. The nurse goes home to a different village, and shortly she has the fever. The neighbors disperse to their own residences, perhaps miles apart, and one, two, or three of them soon give way to unmistakable typhoid. Have they caught it of their sick neighbor, or of their sick neighbor's nuisance? The answer is easily decided *against contagion* by the fact, that they do not become new centres of infection, nor spread the disease in their own healthy neighborhoods. Judged by this test, we think the same result will be arrived at with regard to yellow-fever, — with this exception, however, that the *fomites* of yellow are much more potent than those of typhoid fever, and that the zymotic principle is portable — if closely packed, as in a vessel's hold — to a great distance, and retains its virus a long while.

Let us look at a few cases. We nowhere hear of persons being secured from an attack of yellow-fever by avoiding an immediate contact with the sick, while they remain in their immediate vicinity. Just the reverse is true of plague and of small-pox. Neither is the progress of yellow-fever through a city such as might be expected from a disease which is propagated only by contagion. The friends of those first affected, who visit them in their sickness, are not likely to be limited to their immediate neighborhood, but to reside in various parts of the town. In a contagious disease, therefore, we should expect to see new cases arising in different and distant places, and becoming themselves new centres of infection to others. Yellow-fever, on the contrary, creeps from house to house, and from street to street, as the exhalations which cause it gradually extend.

Of the three visitations of yellow-fever in Boston, each was subsequent to an unusual stress of summer heat; and the fever was principally confined to a small section of the town. The infected district was, in each instance, limited to the vicinity of Fort Hill. A few individuals underwent the disease in other parts of the town, but they were persons who had passed some time, not merely visited, in the places just mentioned, and the disease did not extend to those who attended them. The brother of one sufferer slept with him in the same bed the night previous to his death, and, supposing the disease to be contagious, was afraid to return to his family, lest he should expose them. Yet, notwithstanding the strong predisposition to contract the fever which his fears must have given him, he escaped without any attack.

In 1855, when the yellow-fever was devasting Norfolk, thousands of the inhabitants fled from the infected neighborhood. Some hundreds were landed at, and remained in, Baltimore; very many were taken with the fever after quitting Norfolk and arriving in Baltimore, and about fifty died. Yet not a single individual in Baltimore contracted the disease, or was in any way affected by it.

Fifty cases of yellow-fever were conveyed from New York to the Staten Island Quarantine Hospital in 1856. According to Dr. Harris, of New York, some of these patients were conveyed from closely crowded tenements in the city; some walked down Broadway from Tenth Street to the South Ferry, throwing up the black vomit by the way, and others, on the ferry-boat, were similarly affected on their passage to the island. Now, although this is a fearful illustration of carelessness in the conveyance of cases of a disease supposed to be contagious, yet it is an equally strong argument against the contagion, that not a person is known to have contracted the fever, nor did it spread in any instance.

On the other hand, the only case which occurred in Boston where the patient was neither exposed to the infected locality, nor to the infected ship then in port, was the case of a young girl, whose brother died of the fever, and whose feather pillows, which had been soaked with the characteristic vomit, and had *putrefied*, she picked over and cleansed. Certainly this deserves the name of *fomites*. And so, as we have before stated, the stevedores often contract the disease in breaking out cargoes, even if there be no fever on board; and emigrant-ships, — perfectly healthy, — by being obliged to anchor for some time at quarantine, among the infected shipping, have had the yellow-fever introduced on board.

It is needless to multiply instances. Enough has here been said to indicate, and more than enough was brought forward in debate in the Third National Quarantine Convention to settle, several cardinal points in the natural history of yellow-fever; namely, that it is a disease arising in certain localities, after long terms of heat and moisture, chiefly at the mouths of rivers, and most frequently where the flats have become uncovered and exposed to the sun, as at Norfolk, or where the earth has been freshly disturbed; that the exhalations which cause it are portable in cargoes, goods, cotton, clothes, or bedding, all of which may be properly called *fomites;* — more than this, that it is probable that the air itself, which is laden with the pestilence, may be shut up in a ship's hold, retain its noxious properties throughout an inter-tropical voyage, and develop its poisonous action when the hatches are taken off in port; that the disease may be generated, too, on the voyage; that the poison generally selects the worst parts of our cities, in a sanitary point of view, as its *habitat;* that its virulence may be increased by bringing together many infected vessels at a quarantine station; that it is soonest checked by a low temperature; and finally, that it is not contagious, nor communicable from one person to another.

These views were sustained by a large majority of the members of the Quarantine Convention. Only one dissentient voice among the medical men, that of Dr. Francis of New York, was raised. He is a contagionist after the model of Pym, Chisholm, and Mead; and although entitled to much respect as the Nestor of the profession there, and as having long since announced to his countrymen the important fact that yellow-fever is a disease attacking the same individual but once, yet his views on its contagiousness are opposed by his brother physicians of New York; by the Health-officers and Quarantine and Hospital Superintendents; by Doctors Stevens, Harris, Smith, Miller, Anderson, and many other New York physicians; by Doctors Wood and La Roche of Philadelphia; and by all the medical delegates from the Southern cities, such as Doctors Kemp of Baltimore, Gilman of Washington, Darby of Alabama, and many others, who have enjoyed the best facilities of observing the disease. The final vote stood eighty-five against contagion, to six — of whom only two were physicians — in favor of it. The resolution which was passed by this decisive vote reads as follows: —

> "*Resolved,* That, in the absence of any evidence establishing the conclusion that yellow-fever has ever been conveyed by one person to another, it is the opinion of this Convention that the personal quarantine of cases of yellow-fever may be safely abolished, provided that *fomites* of every kind be rigidly restricted."

We have not the space to adduce as numerous proofs of the non-contagious nature of cholera, which is, we believe, generally admitted by the medical profession throughout the world. Not only is all the evidence of past cholera epidemics against its contagiousness, but its diffusion in the air, beyond the reach of quarantine, is proved by the total failure of all *cordons sanitaires* to exclude it. Some more subtile element, some epidemic condition — which is but a name for our ignorance — pervades, at certain seasons, the atmosphere, in strata, apparently, of well-defined width. With varying, but generally slow progress, the epidemic current pursues a steady, and hitherto a westward course. Little airy streams often part from the main body, and, flying about seemingly at random, devastate a neighborhood, a town, a hamlet, or even a single house, wherever filth, bad drainage, or bad habits offer an attractive *nidus*. It is not apparent that cholera generates infectious *fomites*, unless, with some, we ascribe that quality to the dejections. Other diseases which produce morbid discharges from the bowels have been thought to be contagious, in like manner. Such are dysentery, and, to a less degree, typhoid fever. No doubt the continued exposure of the nurse to the foul gases, as sulphuretted hydrogen, ammonia, and others, which accompany decomposition, and are notably present in such evacuations, will poison, to a certain degree, her system. So will a too long continuance in the dissecting-room produce diarrhœa, and sudden exposure to the mephitic vapors of drains, grave-yards, and cesspools cause vertigo, vomiting, syncope, and even death. But that the peculiar evacuations from the body of a patient will give rise to a disease *sui generis*, identical with the one which caused them, we very much doubt. We do not doubt, however, that certain faults in hygiene — such offences against decency, the sense of smell, and health, as produce typhoid or cherish cholera — will also engender dysentery; and thus nurses and friends may be exposed to the same morbid influences, and contract the same disease, as the patient himself.

Typhus-fever is either non-contagious, or, at the worst, but feebly contagious. It is a virus which is readily dissipated by dilution with pure air. As its ominous names of ship-fever, jail-fever, and camp-fever indicate, it owes its cause to animal effluvia, produced by the crowding of human beings into small and close apartments, and allowing their secretions and excretions to accumulate and decompose. There are times when typhus becomes epidemic, and when it is questionable whether it result not from a poisoned condition of the general air. But as an epidemic it is rare. As a contagious disease, in sporadic cases, it is more rare still. Emigrant-ships and crowded cellars are its chief homes in our times. Formerly it devastated camps, when badly situated; and, decimating the swarming population of the filthy jails of former centuries, it accompanied the criminal into court, and swept away judge, jury, and spectators in indiscriminate death. The sessions were so fatal at one time from this cause, that the justices were obliged to close their courts during some of the English assizes. In these courts, if they resembled in foulness and bad air those of modern days, all the predisposing causes existed, and the disease was only called into life by the concentrated virus of a crowd of prisoners. As we have seen it brought from emigrant transports into the hospital, several cases have been kept in one airy ward with impunity to the other patients. Its *fomites*, however, are virulent, and tenacious of the poison. In this respect it ranks next to small-pox and yellow-fever. Clothes and bedding are peculiarly infectious. The fashionable tenant of a brown-stone house, who has hurried his tailor or dressmaker to produce from his over-worked journeyman a suit or dress in season for some festive occasion, may put on the robe of Nessus under the guise of the latest fashion. Typhus, bred in stifling garrets and feeding on starving frames, may lurk in its folds, and involve the poor seamstress and her patron in a common fate. This is no fancy sketch. No class are more subject to typhus in great cities than the tailors and sewing-girls. And, like many other miseries, it is dependent chiefly on the bad air of their working and sleeping rooms; more perhaps than on little sleep and poor food. It is a vain delusion to suppose that the interests of one class of society can be distinct from those of another. Disease spreads from the hovel to the palace; and all are alike amenable to the operation of sanitary laws.

It is true that the influence ascribed to contagion is often carried too far. The fears of some people magnify every malady into an infectious disease. So, in Italy, phthisis, or pulmonary consumption, has long been regarded as contagious. Good observers, on the other hand, doubt the contagious nature of many of the diseases of childhood, commonly so reckoned. If a contagious disease must be always "catching," — if no one who has not had it is to escape when exposed to it, — certainly by this criterion we must narrow our list of such complaints. Measles and scarlet-fever often go partially through a family, and spare children who are playing, or sleeping, side by side with the sick. It is probable that the hygienic condition of the household, the locality, and the air may have much influence on the virulence, and perhaps on the prevalence, of these diseases. Scarlet-fever, particularly, is apt to be most fatal in those neighborhoods which may be called the home of pestilence. And even if they cannot be prevented by care, cleanliness, and ventilation, they may be greatly modified by such measures, as also may puerperal fever, erysipelas, and the infantile exanthematous diseases.

No contagion is so strong and so certain as that of small-pox. It has been long regarded as the type of all that is "catching." Yet even this fails sometimes. During the Revolution, when prisoners were crowded into the old Jersey prison-ship, of ninety-four persons who had never had the small-pox, nor ever been inoculated, only about forty took the disease. Here, surely, is a marked instance of the occasional failure of contagion. Other instances have occurred within our own knowledge. We have known unvaccinated infants to escape the disease, when in the same house with it; and we are acquainted with one physician, on whom vaccination has never been successful, and who yet has never contracted the disease from his patients, and with another who has had this complaint *twice*, — the real small-pox in childhood, and an attack of a milder form later in life. It may be said that such cases are the rare exception, and prove by their paucity the existence of an opposite law, or rule. But they indicate also, that, if the strongest contagion sometimes fails, that weaker form, which belongs to other pestilential diseases, must fail much oftener.

Perhaps the more rational treatment of small-pox has something to do with dissipating the virus. The older physicians, before Sydenham, did all they could to promote a copious eruption, — by a hot regimen, by covering the patient with bedclothes, by keeping the doors and windows jealously closed, and excluding every breath of fresh air, and sometimes by administering wine and cordials. The celebrated John of Gaddesden improved even upon this. He surrounded the half-suffocated patient with red curtains, red walls, and red furniture of all kinds; everything was to be red; for in that color there was, he pretended, a peculiar virtue.

Worse than this method was the German treatment of that fatal malady, the Sweating-sickness, which raged epidemically, and which Hecker considers to have been the most pernicious and rapidly fatal form of acute rheumatism ever known. In this disease there was a natural sweat, and this was seized upon by the physicians as the grand indication. Whoever, when seized with the pestilence, wished to escape death, *must perspire for twenty-four hours, without intermission.* So says the Erfurt Chronicle; and Hecker continues the story as follows: "So they put the patients, whether they had the sweating-sickness or not, (for who had calmness enough to distinguish it?) instantly to bed, covered them with feather-beds and furs, and, whilst the stove was heated to the utmost, closed the doors and windows with the greatest care, to prevent all access of cool air. In order, moreover, to prevent the sufferer, should he be somewhat impatient, from throwing off his hot load, some persons in health likewise lay upon him, and thus oppressed him to such a degree, that he could neither stir hand nor foot, and finally, in this rehearsal of hell, being bathed in an agonizing sweat, gave up the ghost." What wonder that, with the popular fear and such treatment, Germany was decimated five times by this pestilence; or that miliary fever — a disease almost unknown now — should have visited almost every puerperal chamber, for there a like hot regimen was carried out?

The contagion of small-pox clings a long while to furniture, bedding, and clothes. Its *fomites* are as pestilential as the emanations from the sick. We knew lately of a woman, not otherwise exposed, who contracted the disease by the shaking of the carpets of a small-pox chamber, in such a way that the dust and odor from them covered her, as she was in a state of perspiration. Such articles, therefore, demand as strict a quarantine as the disease itself.

Now, on reviewing what we have endeavored to settle with regard to the *four plagues*, we find them to rank thus, in their order of contagiousness: small-pox, very contagious; typhus, feebly contagious; yellow-fever, not contagious; cholera, not contagious; — and, with regard to their *fomites:* small-pox, very active; typhus, pretty active; yellow-fever, quite active; cholera, not active. Also, we have seen that the contagion of small-pox can be neutralized by vaccination; and the *fomites* of typhus rendered inert by ventilation. Small-pox, then, can be contracted, under all circumstances, from the sick person; typhus can be contracted in foul rooms and a close air, or probably from *fomites*, conveyed elsewhere; yellow-fever can be contracted in certain pestilent localities, or from the air or *fomites* brought thence; cholera can be contracted wherever the epidemic condition prevails.

If, therefore, communities be properly protected from the small-pox by vaccination, and occasional re-vaccination, it follows that typhus and yellow fevers are the only pestilences against which the barriers of quarantine need be erected; and even for them the restrictions should be confined to the *fomites*, and not extended to persons. We shall find, too, that while vaccination is the only preventive for the small-pox, typhus, yellow-fever, and cholera can be most effectually guarded against by sanitary measures alone. As regards the causes of these diseases, small-pox, as we have seen, is occasioned by a specific virus; typhus, by animal effluvia; yellow-fever, by local miasms; and cholera, by an epidemic condition of the air.

Miasmata and specific poisons elude our search. We can easily detect the abnormal elements, such as carbonic acid, sulphuretted hydrogen, ammonia, butyric and lactic acids, &c., which exist in foul air, where there is crowding, with no ventilation. But out of doors the stability of the atmosphere is remarkable. No great decrease of oxygen, and no extensive traces of the above-named noxious elements, are to be found in the air of cities, more than in that of the country. And in no instance have the secret elements of epidemics, which have been often supposed to be minute forms of animal or vegetable life, been revealed to the anxious inquirer. At least, such has always been the case; but we learn lately, by a newspaper, that a certain professor in Missouri — who must be the happy owner of a microscope of "a patent, extra-million magnifying power," as Mr. Weller said, when asked whether he saw Mr. Pickwick embrace the fair Bardell, being separated from them by two walls and a flight of stairs — has succeeded in isolating and defining the spores, or zoöphytes, which swarm in the miasm of yellow-fever. Our faith in this gentleman, who has so far surpassed such *savans* as Faraday and other humble inquirers abroad, is somewhat shaken by the next paragraph, which informs us, that the discovery of the cure has been contemporaneous with that of the cause of the pestilence, and that the remedy can be had at so much per bottle. We fear that the miasmata of intermittent, bilious-remittent, and yellow fevers, and of cholera, will ever remain as securely hidden as the almost tangible poisons of syphilis and small-pox. Both seem within, yet are just beyond our reach.

It will be more profitable to inquire what science and sad experience can teach us of the influence which a good or bad sanitary condition may exert on the prevalence and the spread of pestilence.

In an article in the "British and Foreign Medico-Chururgical Review," on "Cholera in its Relations to Sanitary Measures," written soon after the epidemic visitation of 1848–49, we find many statistical statements, of which we shall freely avail ourselves, as they are more extensive than any which have been made in this country.

Of all the circumstances affecting health, none is so important as the condition of the air that we breathe. On it, more than on the food we eat, depends the purity of the blood and the right exercise of every function of the body. Air is food. Oxygen is even more essential than carbon and nitrogen to our support, and it is a food which we consume unceasingly, asleep or awake. Respired air has lost one fifth of the oxygen which it contained, and contains a nearly equal volume of carbonic acid in its place. How, then, can the same portion of air be inhaled again without detriment? If we take the ordinary computation of 20 cubic inches of air as drawn into the lungs at each inspiration, and of there being about 20 respirations in a minute, then 333 cubic feet, or 33 hogsheads, are made use of by each person, *per diem*. Not less than between 10 and 12 cubic feet of carbonic acid are therefore evolved in twenty-four hours; a quantity which will contain at least 6 ounces of solid carbon. The inadequate discharge of carbonic acid — besides the more direct effects of oppression, loss of appetite, and impaired muscular energy — renders the body less capable of resisting the influence of baneful agencies from without. But respired air is also charged with a large amount of watery vapor. From 16 to 20 ounces of fluid, at least, are exhaled from the lungs in twenty-four hours. It is not mere aqueous vapor which is thus exhaled; there is effluvial matter mixed with it, or dissolved in it, — a matter which, upon being condensed, is found to be of a highly putrescent and rapidly decomposable nature. It is one form of the waste, and therefore excrementitious, products of the system, which are continually eliminated by the lungs, skin, kidneys, and bowels. That the atmosphere of ill-ventilated rooms, where a number of persons have been congregated for some time, is tainted with this animal effluvium, is obvious from the peculiar sickening smell perceived on entering a crowded dormitory in the morning, or even a large school-room, after children have been in it for several hours, — unless the apartment has been thoroughly ventilated. Medical men, after visiting the wretched abodes of the poor, often retain for several days in their clothes the offensive smell of such localities; — how thoroughly, then, must the bedding and furniture of such apartments, as well as the garments of the inmates, be impregnated with it! It clings to the very floors and walls. The pollution of the atmosphere from the existence of this noxious organic matter in it is probably a more influential cause of some diseases, — as typhus, — and more frequently predisposes to epidemic disorders, than even the vitiation from excess of carbonic acid.

But the lungs are absorbing, as well as excreting organs; they are as ready to take in, as they are active in giving out. The blood is permeating every part of them with such rapidity, that the entire mass of it probably circulates through them, and is exposed to the air contained in their minutely divided cells, in little more than three minutes. How favorable is such an arrangement, when coupled with the exquisitely delicate fabric of the pulmonic tissue, to the imbibing or absorption of all volatile matters in the respired air, and hence of all effluvia!

Now it is the result of experience, that health and strength cannot be maintained in a space of less than 700 to 800 cubic feet; and that to live and sleep in a space of less than from 400 to 500 cubic feet for each individual is not compatible with safety to life. Nor will even this space suffice in an air-tight apartment. Air containing only ten per cent of carbonic acid, is incapable of supporting life. The extent of space to each person ought, of course, to be greater during the prevalence of any epidemic or contagious disorder.

"A striking illustration of the effects of *overcrowding* on choleraic invasion, is afforded by what took place at Taunton. The town — of 16,000 inhabitants — was tolerably healthy. Cholera attacked the workhouse, so violently, that in ten minutes from the time of seizure the patient was in a state of hopeless collapse. In one week, 60 out of 276 inmates — nearly one fourth — were swept away, and the survivors suffered from diarrhœa. This workhouse was low, badly drained and ventilated, and had numerous nuisances within its walls; the people had insufficient space allowed them, and personal cleanliness was neglected. It had been very subject to measles, scarlet-fever, typhus, dysentery, and scurvy. But the greatest mortality occurred among the girls; out of 67, one half were attacked, and 25 died. But only 10 deaths occurred among the boys. Why was this? The greatest overcrowding existed in the girls' school-room, which was a slated shed, 50 feet long, 9 feet 10 inches broad, and 7 feet 9 inches high. In this miserable place were huddled together 67 children, with about 68 cubic feet of air to each. The boys' school was worse than this; *but they could not be kept from breaking the windows!*

"Meanwhile, no actual cholera, but only bowel complaints, visited the town; and in the jail, where the prisoners were well cared for, and had from 800 to 900 cubic feet of air to each cell, not a solitary case of diarrhœa, even, occurred!"

But the crowding of workhouses never reaches that degree which is, unfortunately, but too common in the dwellings of the poor, and especially in the lower class of lodging-houses. In one report, we read of 37 human beings, in London, men, women, and children, being crammed into a room 10½ by 13 feet, the majority of them nearly naked and very filthy. The inevitable pollution of the air is extreme. When a single case of febrile disease occurs in this atmosphere of putrid vapor, the morbific fermentation — zymosis — proceeds with extreme rapidity, and the ravages of death are appalling.

"On the night of July 9th, the great outbreak of cholera in Stonehouse Lane took place, and between that time and the 17th there were 64 deaths in a circle the diameter of which did not exceed 80 yards. The inhabitants of that dismal place were chiefly Irish, of the lowest and most degraded class, herded together like cattle, ragged, half naked, and inconceivably filthy; dead to all proper feeling, even the scenes around them made no good impression, for they stole the spirits, and everything they could lay their hands on, even the blankets from off the dying. Their disease was aggravated by the determination of the living to retain the dead, sometimes until long after decomposition had been established, for the sad but noisy obsequies of their country and religion. Of one family of nine persons, four died; and in another house, a whole family, root and branch, was swept away. The dead and the dying lay together in one small room, which was in so horrible a condition, that, when the bodies were removed, the only way it could be cleansed was by introducing the hose of a fire-engine through the windows and washing all down stairs. The consternation among all classes was such, that none in the town would receive those who desired to fly from the infected place, and a few, who had escaped into another lodging-house, were hooted back to the plague-spot whence they came."

So too we learn, that at East Farleigh 1,000 persons, of all ages, were employed, temporarily, on a single farm, to pick hops. They were lodged in sheds and out-buildings, so crowded that many had but 50 cubic feet of air apiece. Within four days of the first seizure, there were 200 cases of diarrhœa, 97 of cholera, and 47 deaths. On other farms, with better accommodations, there was but little sickness. And during the cholera epidemic of 1834, 34 hop-pickers died on this same farm, but the disease did not prevail elsewhere.

At Juggernauth, in India, at the annual festival, the number of pilgrims who arrive often amounts to 150,000. The inhabitants are quite healthy before the festival; but on the arrival of the pilgrims, and when the lodging-houses are crammed, cholera suddenly breaks out, and in a few days hundreds are cut off by it. This is an invariable occurrence; and the disease as suddenly disappears on the dispersion of the crowd.

Severe outbreaks of cholera have also repeatedly occurred on board of emigrant vessels, — occasionally, too, when the ship has sailed from a healthy port, and there is no known origin for the germs of the disease. The inference is, that they must have passed through a stratum of atmosphere loaded with some peculiar influence, which, under favorable circumstances, produced the cholera poison.

The next determining cause of cholera — and indeed of other epidemics — is the vitiation of the atmosphere by putrid effluvia. It used to be doubted whether bad smells were really injurious. Much stress was laid on the fact that night-soil men are often hearty and vigorous. By some it has even been thought beneficial for children with the whooping-cough to be held over a privy, and for consumptive patients to live in the air of a crowded cow-stall. Such views, happily, are now obsolete; we again trust to our noses, and turn a deaf ear to the argument of the workhouse guardian, who would not admit that the effluvia of cesspools could be unhealthy, because he had lived near one all his life! Experiments instituted on animals show the toxical effects of the chief gases in sewer emanations; namely, carbonic acid, sulphuretted hydrogen, and sulphide of ammonium. A mouse, exposed in a cage to the air of a cesspool, though well fed, died on the fifth day. Dogs thus exposed suffered from vomiting, diarrhœa, febrile symptoms, rigors, restlessness, thirst, and loss of appetite. The gases were then experimented with separately. A puppy, exposed to less than two per cent of sulphuretted hydrogen in common air, died in two minutes and a half. A dog, exposed to .0205 per cent of this gas, was affected within a minute by tremors, and fell on his side; the action of the heart became irregular, and within four minutes respiration ceased. Ammonia, and its salts, produced unmistakable typhoid symptoms. The minute quantity of 56 parts of sulphuretted hydrogen in 1000 of common air, was sufficient to occasion serious symptoms, — eructations, tremors, rapid and irregular respiration and pulse, and diarrhœa. The inhalation of carbonic acid, in small proportions, was also followed by diarrhœa. These symptoms, resulting from the inhalation of sulphuretted hydrogen, carbonic acid, and sulphide of ammonium, are sufficient to account for the effects arising from cesspool effluvia, without seeking for any further product from such emanations.

> "Immediately opposite Christchurch Workhouse, Spitalfields, and separated from it only by a narrow lane, there was, in 1848, a manufactory of artificial manure, in which bullock's blood and night-soil were desiccated by dry heat on a kiln, causing a most powerful stench. The Workhouse contained about 400 children. Whenever the works were actively carried on, and particularly when the wind blew in the direction of the house, there were produced numerous cases of fever of a typhoid form, a typhoid tendency to measles and small-pox, and an unmanageable and fatal form of *apthæ* of the mouth, ending in gangrene. In December, 1848, cholera having already appeared in town, 60 children in the Workhouse were suddenly seized with diarrhœa. The manufactory was closed, and the children returned to their usual health. Five months afterwards the works were reopened and the stench returned. 45 boys, whose dormitory faced the manufactory, were again seized with diarrhœa: the girls, who slept in a distant part of the house, escaped. The manufactory was suppressed, and there has been no return of the disease."

The emptying of a cesspool is often followed by diarrhœa among some of the inmates of the house. At a boarding-school in Clapham, a foul cesspool was opened in August, and its contents spread over the garden. Within three days, 22 of the boys were seized with alarming symptoms of the stomach and bowels, subsultus of the muscles of the arms, and excessive prostration of strength. Two cases proved fatal. If such an event is liable to take place in ordinary seasons, how great must be the danger when an epidemic is abroad!

The "Potteries," near the West End of London, are probably unsurpassed in filthiness. It is said that 3,000 swine are kept there. The streets, courts, alleys, and yards are without a drop of clear water; there are no sewers, and all the drainage of the pig-sties and privies is left on the surface, close to the very doors and windows of the houses, or flows lazily into a large stagnant pond, called the "Ocean," which is covered with a filthy slime, and is constantly bubbling with putrescent gas. In the first ten months of 1849, there were 50 deaths among 1,000 persons. The evils of a locality like this are not confined to itself: the residents in the neighborhood have to suffer from its pollutions. About a quarter of a mile distant is Crafter Terrace, a row of clean, airy, respectable houses. There was no cholera there until September 9, 1849, when the wind and stench came directly from the Potteries. In the next twelve days, there were seven fatal cases in this single block.

> "At Hamburg, in those streets which immediately face the spot where the numerous canals that have traversed the city, and have become loaded with the excreta of 175,000 people, concentrate to pour their foul contents into the Elbe, the cholera destroyed three per cent of the inhabitants, while the residents near other parts of the river suffered much less."

The exhalations from *foul mud at low tide* are also among the predisposing causes of pestilence. While cholera was prevailing in the town of Cardiff, the water in front of 17 houses was drawn off, to repair a lock: the occupants of 15 of the houses were soon affected with prostration, tremors, vomiting, and diarrhœa. There were 43 cases of diarrhœa, 33 of cholera, and 13 deaths. The other houses in the neighborhood, at a little distance on one side of the basin, escaped entirely. When the water was re-admitted, the air became pure at once, and the disease was speedily arrested.

So, too, the yellow-fever almost invariably locates itself in the worst-paved, worst-drained, and filthiest portions of New Orleans. It has been well said, that dirt may be the soil, but not the seed of disease. We do not wish to imply that yellow-fever arises wholly from such causes; but it is certainly helped by them. In Philadelphia, every visitation of yellow-fever, from 1699 to 1853, has been in the same neighborhoods, — around the low places and wharves, and near a main sewer. In 1699 and 1853, the epidemic began at spots not three hundred yards apart.

Dampness is a third cause which favors the march of pestilence. In London, both in 1832 and in 1849, the stress of the cholera fell on the districts near the river-banks. St. Petersburg and New Orleans, built below the level of the river, are chosen homes of cholera and yellow-fever. Like facts have been observed in Hamburg and in France. Yet during the height of the last cholera epidemic in London, the air was unusually dry. It was also very close and oppressive, and so stagnant that there was not a breath of wind on the Thames. This motionless state of the atmosphere, if associated with heat, is the most pernicious of all to health, because putrid effluvia are not dissipated, while the process of putrefaction goes on with unusual rapidity, and the molecular germs of zymotic disease are probably more quickly developed. The functions of the skin are much impeded; thirty ounces of watery vapor, and about two ounces of excrementitious matter, are thrown off by the skin in twenty-four hours. In close, foggy weather, this function of excretion is obstructed; the perspiration clings to the skin; evaporation is prevented, and feverishness induced. At the same time, the activity of the cutaneous absorption is increased by moisture, which thus produces just the opposite of excretion. Therefore less is thrown off, and more — poisons if they exist in the air — can be taken in. Hence the importance of protecting the surface with light woollen clothing, of avoiding the night air and the basement stories as sleeping-rooms, and even of keeping up a small fire, to insure dryness and a circulation of air. So, too, houses which rest on an undrained site are more exposed to infection than those which are high and dry.

The influences of impure water, unwholesome or insufficient food, intemperance, and fatigue also favor the advance of epidemics. Probably bad water comes next to bad air as a cause of cholera. Numerous instances of diarrhœa in camps and armies are known to have been owing to the use of pond-water full of organic matter. Certain houses are spoken of which were supplied from a well in close contact with a cesspool; and almost all the persons drinking the water were affected with disordered bowels. The same locality was severely visited with typhus; and where fever is found, there is the chosen seat of cholera. A gigantic — though involuntary — experiment was made in London in the epidemics of 1848–9 and 1853–4. Throughout the southern districts, comprising one fifth of the population of the metropolis, there were distributed two different qualities of water, by rival water-companies, — one pretty good, the other very bad. Now it so happened that the company which supplied the bad water in 1848 gave good water in 1853; while the other company, which supplied good water in 1848, grew careless, and gave very poor water in 1853. The result was as positive as a crucial experiment. The population who took bad water in 1848 took good in 1853, and *vice versa*. Death, too, shifted sides, and followed the bad water. The mortality from cholera was three and one half times as great among the bad-water drinkers; and both halves of the community were afflicted in turn. Their sanitary condition, in other respects, was similar enough to be fairly comparable.

Very much of the water used in London is polluted with the drainings of sewers and cesspools. Such waters when analyzed are rich in nitrates, phosphates, and ammonia, all indicating organic matter from the foulest sources; and when put under the microscope they swarm with *vibriones*, *rotifers*, and other animalculæ, and with many forms of *confervoid* vegetable life. These little creatures are scavengers, who, though they do no harm themselves, are indicative of the presence of the matters on which they live. The deluded people of London, we are told, send a long way for the water of certain favorite pumps, because they are cool, sparkling, and supposed to be very pure. The coolness is owing to the presence of *nitrates* indicative of organic matter; and the effervescence, to carbonic acid, or a trifle of ammonia, derived from the deeper drainings of a soil reeking with the liquid deposits of grave-yards and sewers.

In our own city, as we learn from the "Report on the Cholera in Boston," "isolated instances of the cholera were noticed in even the most salubrious portions of the city; but, with few exceptions, the disease was confined to unhealthy, ill-ventilated, and crowded localities." So much were the physicians of the Cholera Hospital impressed with this fact, that they had sketches taken of the worst places around Broad Street, and sent in with their report to the city government. In looking over the history of the successive visits of epidemic cholera in England, we are not surprised to find that the disease recurred repeatedly in the same neighborhoods. At Leith, Pollockshaws, and Torquay, cholera marked its first victim in the second visitation in the very house that it did in its first. At Oxford, the first case in 1849, as in 1832, occurred in the county jail. A similar return to its former haunts was observed on the Continent.

There remains but one other argument to complete the logic of this terrible testimony. Cholera is well called the "inspector of nuisances"; does it shun the spots where nuisances have been abated? The three Model Lodging-Houses, in London — two of them situated in a most unhealthy district, with numerous fatal cases around — escaped almost entirely. The complete immunity of the "Metropolitan Buildings" in Old Pancras Road, containing upward of five hundred inmates, was equally striking; although within a few hundred yards the epidemic was so severe that three deaths occurred in one house, and the whole neighborhood was afflicted with diarrhœa. In the Model Prison at Pentonville, whose sanitary arrangements are good, there was no cholera among 465 inmates. Giltspur and Newgate enjoyed an almost complete exemption, although the district around suffered with extraordinary severity. At the House of Correction in Coldbath Fields, in 1832, there were among 1,148 prisoners 319 cases of diarrhœa, 207 of cholera, and 45 deaths. At that time the drainage of the prison was most faulty. The whole sewerage having been rebuilt, and ventilation improved, in 1849 out of 1,100 prisoners there was not a single instance of cholera, and only a few mild cases of diarrhœa. So the Lunatic Asylums of Bethlehem and Hanwell escaped without loss of life, although cholera prevailed around them. Hamburg suffered very severely in 1832. In 1842, one third of the city was burned down, and it was subsequently rebuilt with due regard to drainage and other sanitary requirements. In 1848, the rebuilt part enjoyed an exemption from cholera. Exeter and Nottingham, after due sanitary reforms, offer analogous results.

Verily the deafness of municipalities to the sanitary requirements, as well as to the other miseries of the poor, are well portrayed in the fierce complaint of Charles Mackay's "Cholera Chaunt": —

> "I see his foot-marks east and west,
> I hear his tread in the silence fall:
> He shall not sleep, he shall not rest, —
> He comes to aid us one and all.
>
> . . . . .
>
> But they will not hear his warning voice:
> The Cholera comes. Rejoice! rejoice!
> He shall be lord of the swarming town!
> And mow them down, and mow them down!"

We must not fall into the common error of supposing that these great horrors which we have described are all the causes of disease; that we who live in good neighborhoods are safe; nor that thousands of lesser infractions of sanitary laws will fail to bring their penalty. By unconsciously inhaling a small modicum of sewer gas, by bad drains, by poor water, by defective ventilation, we all may be in danger of disease and death.

In an article on "Nature and Art in the Cure of Disease," in this Review for July, 1859, we called attention to the superlative importance of Hygiene, or *Preventive* Medicine. "The Third National Quarantine and Sanitary Convention," likewise, wisely decided to devote most of their attention to reports on sanitary subjects, rather than to quarantine. In the words of Dr. Wragg, "Sanitary measures first; quarantine next; and in time of disease, or when panic is taking hold of the minds of the people, both together." Thus, again, on a similar sanitary question, Mr. Viele says, "There is probably no subject so complex, so incalculably difficult to grapple with, especially if it be how to apply a remedy, as the drainage and sewerage of large overgrown cities. Yet we must perceive that, unless this be efficiently done, *an ultimate limit is set by the hand of man to himself, to dynasties, to peoples, and to nations.*" The importance of sanitary reform cannot be over-estimated. Sanitary science — like social science — is new; it is eminently the offspring of an age which devotes itself to organic chemistry and the microscope as well as to reforms. Like other new sciences, it comes to us from an older civilization. Germany, England, and France are its birthplace. The great centres of London and Paris are its true fields of observation, because there the great questions of a high civilization and a crowded social life are first studied and recorded. It would be wise for our country to learn the lesson in time from its parents.

Hygeia, the goddess of health, was called the daughter of Æsculapius. As identical with the Latin goddess Salus, she was honored by the Romans with a temple and festivals, and one of the city-gates was called the *Porta Salutaris*. It might surprise a modern health-officer to learn the extent of the sanitary measures which were carried out in Rome, and how much the office of the ediles resembled his own. Rome's whole attention was not devoted to war; and the boast of Augustus, that he found the city of brick, and left it of marble, should not so much excite our admiration, as the labors of his son-in-law, Agrippa, the architect of many of her aqueducts and sewers. The work of drainage and sewerage was begun by her kings, and continued during the Republic on an immense scale. The inner diameter of the *Cloaca Maxima* was thirteen feet; and earthquakes and the neglect of fifteen hundred years have not moved a stone out of its place. Much of the plain lying between the Seven Hills was marshy, and required the successive draining of centuries. The Campagna, once reclaimed, has returned to its pestilential desolation. The aggravated periodical fever, which, under the name of *pestis*, ravaged the city, yielded, in a great measure, to paving. The aqueducts, nine in number, and coming from distances varying from seven to sixty miles, furnished water enough to flow through the numerous fountains and sewers like rivers, and to suffice for the colossal Public Baths. Special officers, the *Curatores Aquarum*, were invested with the care of the water-works, and were considered of consequence enough to be accompanied, in their tours of inspection, by an architect, secretaries, lictors, and slaves. The comprehensive jurisdiction of the ediles included the supervision of the public buildings — temples and theatres — and of private edifices, to such an extent that they should not endanger nor incommode passengers on the streets; and also of baths, aqueducts, and common sewers, as well as the control of the markets and public houses. The ediles took care that the health of the people should not suffer by bad provisions, which they threw into the Tiber; nor their morals by bad women, whom they had authority to banish from the city. In short, they combined the duties of architects, health-officers, and a correctional police.

Paris, perhaps, presents the most perfect example of the completeness and successful working of modern sanitary laws. The care of a paternal, though despotic government, which acts upon the principle that the people, like children, cannot take care of themselves, and the naturally minute and methodical character of the French, have combined to carry the supervision of science into every department of life. Water, it is true, is not conveyed into all the houses, but the supply is abundant and pure. Numerous fountains cool the air and adorn the city, and the whole system of drains and sewers is flushed, as with a river, for one hour, twice a day. The sewerage is, perhaps, the best that exists in any city of its size. The main sewers rival the Roman *cloacæ;* and are so large, airy, and clean, that they are navigated by boats, and traversed by a sidewalk. Already immense sums had been spent upon them; but, as it was found that their contents polluted the Seine, two new sewers have recently been constructed, which run parallel to the river, and, receiving the whole *ejecta* of the city, empty a long way below it. The same scrupulous care is bestowed upon the streets; they are swept daily, and the roadway is so clean, that it is almost as much used by foot-passengers as the *trottoir*. A penalty of twenty-five francs prohibits the throwing of the most trivial thing into the street. The air is kept free from nuisances, either of a chemical or industrial nature, by the banishment to the suburbs of manufactories and *abattoirs*. More attention, if possible, is devoted to the purity of drink and food. The wine is inspected, the butcher's shops visited, the bread weighed, and every drop of milk tested by the lactometer. Consequently the bread is the best and the milk the purest to be procured in any city in the world. And the sale of drugs, medicines, and particularly poisons, is restricted by the severest penalties.

Now, is any tangible result to be shown for all this, or is it merely theoretical? Unquestionably the Paris of the Middle Age was very dirty, and the Paris of to-day is very clean. But what has followed from it? The mortality of Paris in the early part of the fourteenth century averaged 1 in 20, whereas the ratio in 1830 of all deaths was 1 to 32: the poorest ward, where destitution was extreme, gave a death-rate of only 1 in 24; and among the more wealthy classes, it was 1 in 42. Therefore it is safe to say that the poor mechanic of the nineteenth century, who resides in the French capital, is better off on the score of air and comforts, and enjoys a greater chance of living, than the rich citizen of the fourteenth century. At the same time, the population is 300 times greater, at the present day. As we ascend in the social scale, we find that the wealthy now have twice the prospect of life in Paris that they had then. At Geneva, according to the mortuary statistics of M. Marc d'Espine, the difference is still more strongly marked. The probable life at Geneva, in the sixteenth century, was rather less than 5 years; in the seventeenth century, 11 years; at the beginning of the eighteenth, 27 years; at the end of the century, 32 years; and now it is 44 years.

In England, like results have been attained, although the constitutional form of the government, and the consequently feebler executive, render them less extensive and complete.

Have we profited by the lesson? For, unlike the case in older countries, many of our cities have been laid out at once, instead of growing by successive accumulations; thus affording us the best possible opportunity for a good hygienic foundation. Some of the Western cities have been well laid out. Others, like Chicago, in consequence of their fearful mortality, are obliged to be raised, after they are built, at an immense expense. Some are so dirty, and so poorly located for health, like New Orleans and St. Louis, that yellow-fever haunts the one, and cholera the other. A startling fact, which tells in a few figures the deplorable state of the public health in the city of New York, is its gradual deterioration during the last forty-six years. Thus in 1810, with a population of 96,000, the deaths were 1 in 46 ; whereas in 1857, with a population of nearly 700,000, the deaths were 1 in 27. If the mortality of London bore the same ratio to population as that of New York, it would be 92,784, in place of 56,786. No city possesses better natural advantages for health than New York. The soil is so dry that sub-cellars are dug and used in many parts of the city, and it is bathed on either hand by noble estuaries, which cool it and render it clean. Internal causes alone can have produced such a fearful increase of mortality. New York has copied all the architectural, as well as social, vices of the Old World. If in Liverpool there are 2,398 courts containing 68,365 persons, and 7,892 cellars with a population of nearly 40,000 ; and if in Nottingham 8,000 houses are built back to back, and side to side, with no other outlet than the street door ;—in New York the cellar population is 25,000 ; in Cherry Street there are tenement houses containing more than 500 persons ; and "Rotten Row" consists of eight houses, fronting each other, and as many more in the rear, containing 1,250 persons in a space of 180 feet by 50 feet. The pestiferous stench and filth of these pent-up apartments exceed description. Conflagration often purifies them ; but latterly we have seen many lives sacrificed to a want of proper outlets. The small quantity of air and of light produces a much greater mortality than bad food and clothing ; for people living in the same way, except in better localities, have been 75 per cent better with regard to mortality than those who lived in cellars. During the cholera season not a patient recovered who was allowed to remain in a cellar. By comparing the worst with the best wards, we find (1856) the Sixth Ward, with 25,000 inhabitants, living in 1,400 dwellings, and the deaths 1,089 ; the Fifteenth Ward, with 24,046 inhabitants, living in 2,445 dwellings, and the deaths 436. Deaths in the Sixth Ward were 1 in 23 ; in the Fifteenth Ward, 1 in 55. In 1857, we find the deaths in the Fifteenth Ward to be 1 in 69; but in the First Ward, 1 in 22. Boston is as crowded, in some parts of the North and East ends, as New York, though its death-rate is better. Philadelphia, more wisely laid out, and spreading over more ground, has a larger number of houses to its population.

Shall we erect quarantines against a foreign foe any longer? Is anything more needed to prove that the enemy is within our walls?

It is with great pleasure that we have perused the very able report of Dr. John Bell, on the "Importance and Economy of Sanitary Measures to Cities." It reviews briefly the Public Hygiene of Ancient Nations; treats of the Causes of Pestilence, and the Neglect of Sanitary Legislation; of Paving; Street Cleaning; Sewerage, and Sewer Gases,—their Remedy, and the Disposal of Sewage; Ventilation; Defect of Light; Model Houses; Water Supply; Intemperance; Preventable Diseases; Sanitary Improvements; Public Parks, Gymnasia, Baths, and Wash-Houses; and Nuisances,—as Slaughter-Houses, Cow-Houses, and Intramural Interments. On many of these topics we have already dwelt long enough. We propose, in conclusion, to advert briefly to the others, and among them to Paving, Sewerage, Ventilation, Preventable Diseases, and Nuisances.

Evils from neglect of *paving* are pointed out in most reports on the health of towns. Before the streets of London were paved, the inhabitants were as great sufferers from periodical fevers as those of the worst rural districts. Now the death-rate of London is a trifle better than the average of the whole kingdom. In Philadelphia, the exemption from intermittent and bilious-remittent fevers has, with great uniformity, followed the paving of the streets. Paving ought to precede the erection of houses in a new city. The city of Louisville, Kentucky, is one of the most marked examples of the good effects of paving. Intermittent fever was a regular annual visitor, and occasionally a form of bilious fever prevailed, which was as fatal as yellow-fever. After the streets were paved and the ponds filled up, Louisville, from being called the grave-yard of the West, became one of the most healthy cities. This change was brought about without the aid of sewerage. Periodical fever will be prevented from showing itself, if its favorite haunts are covered with a good pavement, so as to separate from the sun and air the bed of moist, putrefactive materials, which ferment, and give rise to noxious gases.

Paving is of less benefit if the streets are not well scavengered. The expense of street cleaning has been used as an argument against it. But London balances the cost by the sale of ashes and dust; and the city of Aberdeen derives from its streets an annual profit of three thousand dollars.

Sewerage is not surpassed, in its importance to health, by either ventilation or pure water. From the sanitary records of Manchester, we learn that the mortality in the undrained streets amounts to four per cent, and in the drained districts it is only two per cent; and some streets with a mortality of 1 in 32 were elevated by sewerage to 1 in 50. It has been well said that the course of typhoid fever in a town may be tracked by that of neglected sewerage. Sewers may produce great evils by being emptied into a river. The Thames is thus converted into an open drain, and the exhalations for the past few summers have been so offensive as to alarm the whole of London. Paris has found it necessary to construct covered tunnels, parallel with the Seine, to remove a similar evil; and London will be driven to a like expensive measure erelong. Heedless, as usual, of all the lessons of experience, New York and Boston follow the same plan of emptying all their sewage into their harbors. Worse than this, the mouths of the main sewers are exposed at low tide, and give out most offensive smells, propagating pestilence, and in the summer of 1859 rendering that section of Boston which is generally the most salubrious almost uninhabitable. The nature, the amount, the fertilizing power, and the waste of sewage, are now attracting the serious attention of the economists, sanitarians, and scientific agriculturists of England.

The contents of the public sewers of a city are very complex, consisting, not only of the solid and liquid *ejecta* of the population, but also of the fluid refuse of every branch of industry. The filth of kitchens, laundries, and dye-houses; the drainings from stables, slaughter-houses, and the public markets; the various liquid impurities of trade and manufactories; and the washings of the streets and alleys, — all go to swell the amount of sewage.

Altogether, it is calculated that the daily sewage of London is equal to 233 tons of solid matter, diluted with about 84,750,000 gallons of water. This is from the drains of the houses, and the washings of the streets, which last item comprises about 81 tons of pulverized granite and iron, the washings of the roads and thoroughfares. Besides this, there are 102 tons of saline matter dissolved in sewer-water, consisting chiefly of carbonate of lime, common salt, and the alkaline sulphates and phosphates; and finally 152 tons from trade and manufactures. The grand total of solid matter rises then to 487 tons *per diem*, of which about 215 tons are organic. The value of the drainage of London, for manure, is estimated at half a million pounds a year; and of all Great Britain, if we rest the calculation on the actual price in Belgium, where it is saved and so utilized, at fifty-one millions sterling. This is a consideration, certainly, for a country which is getting old, and requires high dressing to support a surplus population. The superfluous millions of China settled the question, ages ago, in their practical way. There, we believe, each man saves his own.

How to deodorize such a mass safely, and without dissipating all the ammonia, which is so valuable a constituent, is a difficult question. The most feasible plan seems to be to dilute it largely with water, to convey it through subterranean pipes, with sufficient back-water to eject it, at convenient intervals, by hydrants, and thus to irrigate the land. In this very dilute state it is said to be most readily taken up by the absorbent radicles of plants.

We have already alluded to the constituents of sewer gas, such as sulphuretted hydrogen, carbonic acid, ammonia, sulphide of ammonium, and light carburetted hydrogen, or marsh gas. To these must be added the very considerable leakage from the gas pipes, which permeates the soil, and escapes into the sewers. We have spoken also of the danger to health, not only from main-sewers, but from house-drains, sinks, and gully-holes.

A very marked instance is recorded in Paris. There was a small lodging, which had been successively tenanted by three vigorous young men, each of whom died within a few months of his occupying the place. M. d'Arcet, called upon to make an examination, found that a pipe from a privy, on the upper floor, ran down by the side of the wall, near to the head of the bed where the inmates slept. The pipe was unsound, and the wall was damp from the leakage of the soil into it. Although there was no perceptible smell in the room when examined, yet any doubt as to this being the cause of the sickness which had prevailed there was removed by the fact, that, on the pipe's being repaired, the unwholesomeness of the place was cured. People exposed even to 1 part of sulphuretted hydrogen in 100,000 of air have their vital energies reduced, so as to be more susceptible of disease. Robust men, in excavating the Thames Tunnel, suffered severely from this gas; and although the ordinary test by lead paper indicated no more than the above proportion, by continual exposure they became emaciated and fell into low fevers. Dr. Letheby, after mentioning other methods, finally settles upon wood-charcoal, — which has the property of largely absorbing gases into its pores, — as the best preventive to the miasmata of sewers. "You have but to place a small box of charcoal in the course of the draft" — back through the gully-hole — "of the sewer, and the purification of the air will be complete." Traps, or valves at the upper end, are another method. The lower end should terminate under water, or be closed by a gate, at low tide. Experience shows that there is much less friction and risk of detention of sewage, if the sewer is egg-shaped, or circular. The house-drains, also, should join the main pipe at an acute angle. A fall of only two inches to the hundred feet is enough, with a good back-water.

As we have shown air to be the most essential of vital requirements, so *ventilation* must be among the most important of sanitary questions. Although the better classes may have enough cubic feet of air to breathe, it is not changed often enough. We may not be struck with pestilence in consequence, but we are slowly poisoned, from youth to age, in schools, churches, work-shops, parlors, and bed-rooms. Children are very susceptible, and need much air. In the Lying-in Hospital, Dublin, 2,944 children died out of 7,650; but after careful ventilation, in the same time, only 279. Many think that the bad air of work-rooms is more injurious to mechanics than over-work and poor food. One of the simplest and most gentle modes of ventilation is the admission of external air through a perforated zinc plate, or a fine wire gauze, which is to take the place of a pane of glass. There should be as many as 290 holes to the square inch. It is introduced in the upper part of the window, generally in the corner pane, farthest from the fire, or register. The fine orifices prevent the air from coming in with a rush, and diffuse it through the apartment. This is not all the benefit; for by the law of the diffusion of gases, there is a constant interchange between the pure external air and the impure air of the room, which latter is thus carried off.

We are apt to forget that we can warm our houses quicker by letting out the air already in the apartment. A draft is essential to ventilation, and it is most easily produced by means of heat. Thus, the open fire acts as a ventilator. As a rule, the pure air should be admitted near the floor, and the hot, impure air be let out near the ceiling. Advantage has been taken of the power of heat to create a draft upward, to construct a very effective mode of ventilation, in connection with the hot-air pipes of the furnace. Independent ventilating flues are built in the walls, in proximity to the hot-air tubes, so that they can be connected together by means of a lateral branch tube and register. Thus the current of hot air can be diverted from the hot-air tubes to the ventilating tubes, when the ordinary furnace register is closed, as at night. The ventilating flues terminate in the open air, like a chimney, or through the shaft of the chimney, if one wishes. Now if the hot-air register of a room be closed at ten o'clock at night, and the heat, instead of being thrown back into the furnace, is allowed to pass through the branch tube into the ventilating flue, and so continue until six the next morning, the interior of the ventilating flue will become so thoroughly heated, that it will continue to rarefy the air in it sufficiently to create an upward draft for many hours the next day. At six in the morning, then, the furnace register is re-opened to warm the house, and the communication with the ventilating flue closed. Now if this ventilating flue be connected with the room by an aperture near the ceiling, the course of the air will be as follows. Entering the cellar air-box cold and pure, it passes round the furnace, and ascends to the room warm and pure. After serving to heat the room, circulating through it and becoming old, respired air, it is sucked up into the ventilating flue and passes off, to make room for more. Thus a constant current of pure, warm air may be kept up. The noted apparatus of Van Hecke, in use at the Necker Hospital in Paris, is very similar to this, with the exception of a ventilating fan, driven by steam, in the cellar. The ventilating apparatus propels from sixty to one hundred and twenty cubic inches of pure air, hourly, for each bed.

Light we firmly believe to be connected in some as yet unknown manner with the vital processes of life. As with plants, — as with the eggs of the frog, — which will not develop in darkness, why not with man? Humboldt inclines to the opinion, that exposure of the whole body to the sunlight, as among many savage nations, is very favorable to a good physical conformation. Want of sunlight in basements, narrow alleys, mines, and prisons, produces anæmia, and a pallid, earthy skin; the occupants of such apartments seem etiolated, like celery. Chlorosis is notoriously prevalent among the kitchen-girls of London, who live in cellars and basements. Above all, the influence of the sun is necessary for children. Unfortunately, fashion and the upholsterer exclude the light from the large-windowed parlor, as well as from the low basement. It is the *mode* to live and move in a gloomy, but becoming shade. The mortality of a barrack in St. Petersburg, on the dark side, was two hundred times greater than on the side on which the sun shone.

Efforts have been made, in London and in Boston, to improve the crowded condition of the poor by Model Houses, which give all the inmates certain common privileges, and two good, clean rooms, or more, at a moderate expense. So far as they have been carried out, they have been not only successful in their main object, but a good investment for the builders.

We have said enough, perhaps, about water. We will only call attention to the relatively large consumption of our chief cities, in which Boston heads the list. The average daily consumption of water per head — including domestic and manufacturing purposes, baths, stables, fires, and other uses — is, for different cities, as follows: by an inhabitant of Paris, 2½ gallons; of Vienna or Constantinople, 15 gallons; of Edinburgh, 19 gallons; of London, 20 gallons; of Philadelphia, 30; of New York, 40; and of Boston, 43 gallons. How much of this is consumption, and how much waste?

The persistence in old abuses, arising from an ignorance of hygienic laws, furnishes us with a fearful list of what may be properly called *preventable deaths*. Dr. Playfair thinks there are every year in Lancashire 14,000 deaths which might be prevented, — which are unnatural, and which ought not to take place, — but which do take place, in consequence of a violation of sanitary laws. An ingenious approximate calculation is made as follows. Taking the least unfavorable sanitary conditions of a certain number of people, living in sixty-four districts, in various parts of England, as a standard, we may reckon the difference between this and the general mortality as preventable, and make our estimates accordingly. The people now referred to dwell in sixty-four districts, extending over 4,797,315 square miles; and their number is 973,070, or nearly a million of souls. Although living, undoubtedly, under many favorable sanitary conditions, yet investigation will lead to the detection of many sources of insalubrity; such as small, close, and crowded bed-rooms, and a neglect of personal cleanliness and that of their surroundings. And yet, after all, the mortality annually, per 1,000, of this million of men, women, and children, year after year, does not exceed 17. Setting out from this standard, we are safe in affirming that the deaths in a people exceeding 17 in 1,000 annually are unnatural deaths. In London, during the sixteenth century, 50 persons died, every year, out of every 1,000; consequently the excess over 17 was 33. That this excess was not inevitable is now demonstrated; for, with a great increase in population, the mortality has fallen to 25 in 1,000. Is the excess of 8 deaths a year among every 1,000 living inevitable? This cannot be admitted for a moment, if we regard the as yet imperfect state of the sanitary arrangements of London. Neither is the excess of 5 deaths a year — the mortality of England and Wales being 22 in 1,000 — inevitable, with the evidence of the violations of hygiene before our eyes in every district. If we extend the argument to all of Great Britain and Ireland, we find by calculation, that there are nearly eight millions of people who do not live out half their days; a hundred and forty thousand of them die, every year, unnatural deaths; and two hundred and eighty thousand are constantly suffering from actual diseases which do not prevail in healthy places.

In the State of Massachusetts, an estimate exhibits an annual loss to the Commonwealth of from $ 62,000,000 to $ 93,000,000 by the premature death of persons over fifteen years of age.

In the town of Preston, the loss of children under five years of age is, among the gentry, 17½ per cent; but among the operatives, 55½ per cent. Infants afford the most perfect test of the sanitary state of a city or town. Their delicate organization succumbs the soonest to any morbific influences which prevail. Thus, the fearful amount of cholera infantum in New York — owing it is thought mainly to impure milk, taken from cows shut up in vile cow-sheds, and fed on distillery slops — is a fair indication of the unhealthiness of the city. The Sanitary Committee believe that $13,000,000 and 5,000 lives might be annually saved in that metropolis.

Under the general head of *Nuisances* are included special obstructions to the public health, such as accumulations of dung and offal, pig-sties, open privies, obstructed drains, pools of stagnant water, noxious smoke, and other matters coming from manufactories, and especially the animal refuse invariably found in the vicinity of slaughter-houses, all of which act with so much power in the midst of a dense population. Something has been done to regulate nuisances in our laws, more in England, but by far the most in France. There, the whole class is divided into three lists. In the first belong manufactories of sulphuric, hydrochloric, and nitric acids, and other chemicals; melting establishments of fat on open fires; knackery and catgut makers, and manufacturers of animal black, glue, blood-manure, fireworks, matches, and gunpowder. These cannot be within a radius of 3,000 feet of a dwelling-house. In the second class, which are permitted after suitable inquiry, are plaster-kilns, high-pressure steam-engines, gas-works, tanneries, foundries, chandleries, and many others. The third class must be submitted to inspection, and includes brickyards, potteries, dye-works, &c. Any manufactory, the processes of which are improved, may pass from one category to another. The excessive annoyance from the smoke of bituminous coal in large cities, as in London and Cincinnati, becomes a question of importance to the public comfort and health. It is difficult to remedy this. Tall chimneys only spread the evil over a more distant district. The subject of intramural interments, the last presented by Dr. Bell, though heretofore much agitated in Great Britain, does not possess a practical interest for American cities, now that suburban cemeteries are universal.

The general conclusions arrived at by the "Committee on Quarantine," at the "Third National Quarantine and Sanitary Convention," are as follows: —

1. No system of quarantine laws can guard against diseases which are capable of spreading by any other means than pure contagion.

2. The line of demarkation between contagious and non-contagious diseases is not so clearly defined as to afford a practical rule for their control.

3. The difficulties of enforcing quarantine, after vessels and passengers have entered port, are so great, that it is hopeless to endeavor to effect anything useful by the old plan.

4. The only possible way of restraining the intercourse between the infected and the uninfected, is by a total separation; and to do this, our ports must be shut against the entrance of vessels from places known to be suffering from infectious diseases to such a degree as to be justly called epidemic.

We have already recorded the vote of the whole convention against *personal quarantine.*

We may affirm from our investigations, that there is only one disease that is purely contagious, — small-pox, — and that that can be guarded against by vaccination; that cholera is epidemic, and not contagious; that of the two other pestilences, yellow-fever and typhus, the former is not contagious personally, the latter feebly contagious, while both are infectious by their *fomites.* Against the *fomites* only — the cargo, hold, and clothes, and not the passengers — of these two diseases, is a quarantine desirable. To be useful, it must be very strict; if very strict, it must cripple commerce.

One suggestion may be of importance, — that a suitable Board of Health, composed equally of practical merchants, physicians, and chemists, have the power, during the warm months, of inspecting all cargoes of a perishable nature, when they enter port. In this manner, any danger will be detected before it can spread far; that which is decomposing can be thrown away; and certain parts of the vessel, or cargo, if from a yellow-fever port, or with typhus on board, can probably be effectually disinfected by chlorine. Let all the sick be cleansed, and brought up freely to the hospitals or the city.

We must never let panic cause us to forget the lesson which the labors of the sanitarian should have taught us, — that Hygiene, and not Quarantine, is the law of health; that the danger is at home, among us, and ever present; that the filth or the sanitary misery of the humblest pauper in our neighborhood affects and threatens us directly; and, finally, that, with all our fears, man was meant to resist disease, to live longer than he does, and to overcome all the sanitary evils of his social state, — that he must do so, or die prematurely, and as the fool dieth. Otherwise, by neglecting health at home, and seeking for it elsewhere, we shall resemble the ambitious man in the fable, who went abroad in a fruitless search for Fortune, and, returning, found her sitting at his own door.

ART. VIII. — *Occasional Productions, Political, Diplomatic, and Miscellaneous, including, among others, A Glance at the Court and Government of Louis Philippe and the French Revolution of* 1848, *while the Author resided as Envoy Extraordinary and Minister Plenipotentiary from the United States at Paris.* By the late RICHARD RUSH. Edited by his Executors. With a Copious Index. Philadelphia: J. B. Lippincott & Co. 1860. Royal 8vo. pp. 535.

"NOT a whit behind the very chiefest apostles" of American liberty, in all that constitutes true patriotism, was the